

GOODYEAR
TIRE & RUBBER CO.

CASE STUDY



**GOODYEAR RACING GROUP
CHOOSES NOVAROAM® TO
KEEP NASCAR DRIVERS
'ROLLING ON'**



When the Racing Division of Goodyear Tire & Rubber Company required a communications solution to help it supply one of its highest profile customers, NASCAR, with real-time data about racing tires from not one—but three—NASCAR events around the country, it turned to NovaRoam Mobile Routers from Nova Engineering. This communications strategy combines RFID, Wi-Fi, and NovaRoam's proprietary 900 MHz spread spectrum technology for superior coverage with virtually no interference.

WITH NOVAROAM, NASCAR 'FINISHES FIRST'

Whether it is the Nextel Cup, Busch, or Craftsman Truck series, a NASCAR event is a pure adrenaline rush. For the race fan, there is nothing quite like the sights, sounds, and smells of race day, watching the cars or trucks speed around the oval, drivers and teams execute their strategies with a single goal in mind: being the first to cross the finish line as the checkered flag waves them on to victory lane.

While the thousands of fans are engrossed in the race and the spectacle of the event itself, there is the business side of NASCAR that is unfolding all around them, but with much less fanfare. And, like any business, NASCAR depends on partners to help it operate smoothly and efficiently. When that business is race cars, perhaps no other partner is more important than the one supplying the tires.

The Racing Division of Akron-based Goodyear Tire & Rubber Company, the world's largest tire company, is the official supplier of tires for NASCAR, a relationship whose origins date back more than 50 years when Goodyear first began testing tires for NASCAR at Darlington Speedway. Goodyear's relationship with NASCAR comes with tremendous national and international exposure, but it also comes with some extraordinary challenges.



The average fan in the grandstand or one tuning into a heart-pounding NASCAR race may not realize that individual racing teams do not supply their own tires. Instead, the tires are provided to NASCAR through a leasing agreement with Goodyear. The distribution of the tires to individual racing teams is handled by Goodyear in a highly-controlled manner, all stemming from strict NASCAR regulations developed to prevent teams from gaining an unfair advantage over their competitors. The distribution process is computerized; keeping track of the tires is no easy task.

BARCODES BURN; RFID TAGS TELL THE STORY

"When NASCAR went to this leasing arrangement we really had to step up the tracking process," said Shannon Baker, development engineer with Goodyear. "We need to track every tire in and out to make sure that everything comes back to us," he added, "and that's the way we track things for billing purposes. We used to put barcodes on the tires, but they don't tend to last through a race event. That's when we went to RFID tags. They have survived everything—even crashes on the track."

The challenge, according to Baker, was the large numbers of tires involved, the multiple mounting and dismounting points around the track complex, and the fact that the identifying information for each tire had to be available instantaneously.

"At any one race, you've got 40 racing teams with multiple race cars. Teams return used tires to one of two locations on the track, and new tires to where they are mounted and dismounted," he added. "The RFID tags simplified this process because we could have our people at these stations scanning the tags. The problem was getting the data back to the data center in real time."



"At any one race you've got 40 racing teams with multiple race cars. Teams return used tires to one of two locations on the track, and new tires to where they are mounted and dismounted. The problem was getting the data back to the data center in real time."

— Shannon Baker,
Development Engineer
Goodyear

NOVAROAM: SUPERIOR FOR THE LONG HAUL

“You’re talking about covering each end of Pit Row—that’s close to a mile right there,” continued Baker, “and there is a lot of interference from team communications, and lots of obstructions around the track. Now, multiply this by up to three events a weekend— and you can see the challenge. All of that has to be merged into a single database. We tried a few other systems—they either didn’t work or they were too slow.”

Maintaining adequate records of tire inventories at each race is a tremendous logistical challenge. With 40 teams on the track and multiple tire return locations at a single event, Goodyear has to merge all of the inventory data into a single database in real time. If that isn’t enough of a challenge, traditional wireless communications devices aren’t well suited for this purpose. Obstructions around the track render cellular technology virtually useless, and radio communications equipment experience interference from the race teams and other sources.

Faced with this challenge, Goodyear adopted the NovaRoam mobile ad hoc networking (MANET), or “mesh” networking solution developed by Cincinnati-based Nova Engineering, Inc. “That’s when we went to look at Nova Engineering’s product, NovaRoam,” explained Baker. “We showed them what we needed; they configured the system, ran a few tests, and gave us an evaluation unit. We took it to Daytona and it worked perfectly.”

Baker explained that the NovaRoam Mobile Router provides Goodyear with an ideal solution by offering excellent radio propagation and interference mitigation with 900 MHz spread spectrum operation. At the same time, the system doesn’t depend on the availability of towers or other hardware infrastructure: it is self-contained and completely mobile, and unlike traditional communications “hub-and-spoke” systems, it is not dependent on a centralized controller.

At each race, Goodyear team members use handheld readers to scan the RFID tags embedded in each tire. Each reader has a built-in Wi-Fi transceiver, which transmits the unique tire data to a Wi-Fi access point nearby. The access point is connected via Ethernet cable to the NovaRoam mobile router to provide a long range backhaul link. From there, the data is relayed to another NovaRoam router that is connected to a central server that hosts the tire inventory database. The end result is a wireless network that uniquely combines three complementary wireless technologies: RFID, Wi-Fi and proprietary 900 MHz spread spectrum.

THE PEOPLE AND THE PRODUCT PROVIDE 'MARGIN OF VICTORY'

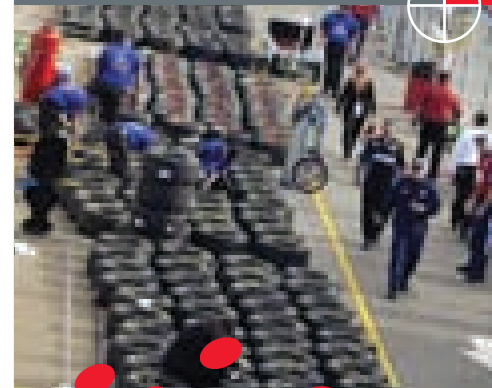
“Nova has been fantastic,” commented Baker, “from shipping antennas to helping us integrate the system into the three haulers that follow each series. We were able to set them right into the system and it doesn’t even know the NovaRoam mobile routers are there.”

“It gives us wide track coverage,” he continued. “They are omni-directional—all you need to do is get the antenna into the air and you’re okay.”

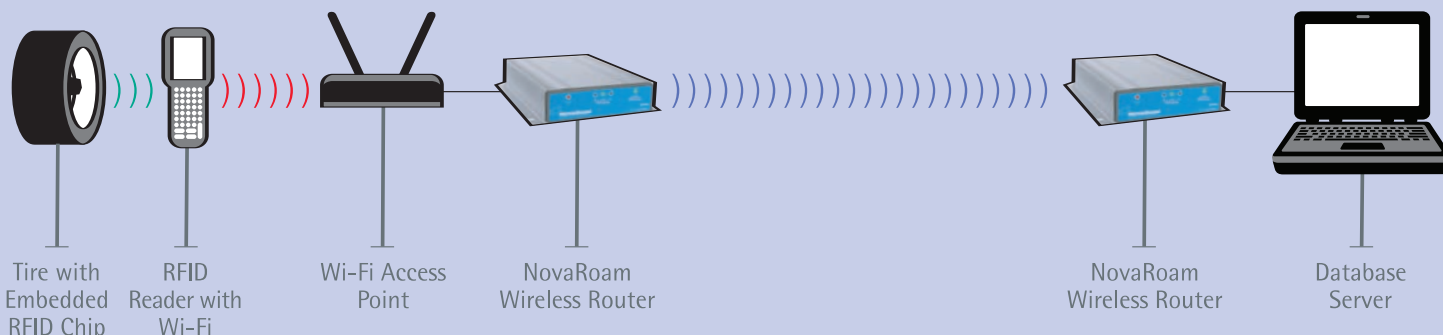
Baker also commented on the turnaround that Nova Engineering provided. “They are great to work with; they really picked up the ball and ran with it” said Baker, “and were able to meet our demands in a very short timeframe.”

“Nova has been fantastic, from shipping antennas to us to helping us integrate the system into the three haulers that follow each series. We were able to literally set them right into the system and it doesn't even know the NovaRoam mobile routers are there.”

*— Shannon Baker,
Development Engineer
Goodyear*



NOVAROAM DEPLOYMENT AT GOODYEAR



NovaRoam E Series Family



NovaRoam ED900 Mobile Router




NovaRoam EH900 Mobile Router

THE BOTTOM LINE? RESULTS AT THE FINISH LINE

At the finish line, has NovaRoam provided Goodyear with the margin of victory? According to Baker the answer is “Yes,” yet the difference or impact can’t be measured in any conventional way.

“It just makes good business sense,” said Baker. “When you consider the kind of exposure that Goodyear receives through its relationship with NASCAR and the value that brings to our company around the world, you just can’t put a price on it.”

Just as NASCAR depends on Goodyear to provide turnkey inventory management and control over race tires, Goodyear relies on NovaRoam to help it preserve and enhance its excellent relationship with NASCAR, reflecting true partnerships between customers and suppliers along the supply chain.

	ED900	EH900
High Speed	••	•
Long Range	•	••
Secure	•	•
Mobile Mesh	•	•
Infrastructure Dependent		
IP-based Interoperability	•	•
Rapid Deployment	•	•
Cost Effective	•	•



Nova Engineering, Inc.
 5 Circle Freeway Dr.
 Cincinnati, OH 45246-1201 USA
 Phone: 513.642.3010
 Toll Free: 800.342.NOVA (6682)
 Fax: 513.642.3300
 e-mail: info@novaroam.com
 web: www.novaroam.com



This material is in the public domain and may be reprinted without permission; citation of this source is appreciated. This brochure has been released into the public domain in accordance with International Traffic in Arms Regulations (ITAR) 22 CFR 120.11(a)(6).